

Mobile Users: Comparing Trends in Denmark and Britain

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ABSTRACT

In this paper, we describe trends in mobile phone use in Denmark and Britain based on observations of information publically broadcast by Bluetooth-active devices in two environments with a mainly 18-25 year-old demographic. The study is based on more than 25000 unique devices found based on almost 500000 data points collected at the Roskilde Festival and at the Lancaster University campus to provide a snapshot of mobile phone use amongst the age group. It is found that the collected data varies from data on market share, suggesting the need to study particular groups separately when studying trends in the market. We find that discoverable Bluetooth devices can provide such insights into trends of use of mobile devices in the wild.

Keywords

Mobile phones, users, usage, trends

1. INTRODUCTION

Information on sales of mobile phones is readily available since it is relatively easy for manufacturers, operators, and distributors to count the number of devices that they have sold. However, identifying what devices are actually used in the wild is a more complex matter. In many western countries there are now more mobile devices than people, hence many devices that may have been purchased but are no longer used. Anecdotally, it is easy to find examples of owners who have bought a new phone before reverting to their previous phone out of preference, or owners of multiple devices who choose a phone to carry as they would select clothes to wear. Of even greater interest is the trends of usage of devices within particular demographics. This information is of vital importance to operators and manufacturers, but equally difficult to determine in the real world.

In this paper we attempt to answer some of the questions regarding the actual use of mobile devices using the observation of information publically broadcast by Bluetooth-active devices in two environments which target a typically 18-25 year-old

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demographic. In the following sections we shall consider the manufacturers market share; the census sites and demographics; the results of the census from the two sites; a comparison of the results between the two census results, and finally some conclusions that can be drawn from the summary.

2. MARKET SHARE

Before we can consider what devices users carry on their person, we need to create a baseline. The aggregated sales figures for manufacturers provide a useful starting point since this informs us as to what devices are sold across all demographics. Table 1 below, shows the market share for the third quarter in 2006 compared with the third quarter 2007. Nokia are a dominant market presence with 38.1% market share (an increase of 3% compared with the previous year), Samsung in second place with 14.5%, Motorola slipping back substantially with 13.1%, and Sony Ericsson and LG trailing behind with 8.8% and 7.1% respectively. By early 2008 Nokia had further increased their market share to over 40% [1] but more recently have warned that their growth has slowed as a result of cost-cutting by their main competitors [2]. Whilst these figures provide an oversight of movements in the industry as a whole they don't actually provide any granularity with respect to movements in particular demographic subsets of the market. Nokia, for example, sell well across all demographics, whilst Sony Ericsson concentrate, primarily, on W-series phones which exploit the Walkman brand name, and K-series phones which trade on the Cybershot brand name, each of which would expect to target narrower demographic groups. Similarly, Samsung phones tend to aim at more fashion-conscious users (collaborating with key fashion influencers [3]), concentrating on looks before functionality.

Table 1. Global Market Share Q3 2006-2007 [4]

Manufacturer	Market Share (%)		Variance (%)
	3Q07	3Q06	
Nokia	38.1	35.1	+3.0
Samsung	14.5	12.2	+2.3
Motorola	13.1	20.7	-7.6
Sony Ericsson	8.8	7.8	+1.0
LG	7.1	6.0	+1.1
Others	18.4	18.2	+0.2

These figures also give a measure of the success and failure of particular manufacturers in marketing their products, since it could be argued that such marketing campaigns could influence the ownership. In reality the mobile phone market is a perfect example of Dilbert's confusopoly [5]. That is, various price propositions are on offer with different combinations of free minutes, texts, and other services, whilst in reality the same level of usage would result in roughly the same cost, leaving the user so confused that they simply choose the product with the name they like the most – a fact most notably recognised by the operator Orange with their animal-themed tariffs, such as Dolphin and Raccoon, and by LG who give their phone's names such as Chocolate and Shine. Indeed, there has been a recent trend to take this a step further with co-branding of phones such as LG's Prada, and Samsung's Armani offerings.

3. LOCATIONS AND DEMOGRAPHICS

The first census site was the Roskilde Festival (the largest North European culture and music festival) for two eight-day periods in July 2007 and July 2008. The festival attracts up to 80,000 people per day, and we captured data from Bluetooth devices at a number of strategic positions placed around the festival site. The second census site was Lancaster University, using a number of positions over a two year period. Whilst the Lancaster census was carried out over a longer period, it has produced information on a slightly smaller set of devices, since the University's population consists of approximately 9,000 full-time students and 2,400 staff, with two additional influxes of students during the census period of 3,500 students each. During this period there will have been some churn of phone ownership, as well as some visitors (although the census sites were chosen to target areas primarily used by students). In both locations, the major group of passers-by are aged 18-25. However, in Roskilde there is an assumed common interest in music whilst Lancaster will represent a wider range cross-section of interests. The 18-25 demographic, and in particular students within this demographic, are an important target demographic, as opinions towards brands can often be built and strengthened during this period, as young adults become financially independent for the first time. The ownership trends within this age group also become important since this is a period when brand loyalty is developed (good experiences with a Nokia for example are likely to lead to future purchases of Nokia's, whilst a bad experience will lead to the purchase of other brands in the future).

4. CENSUS METHOD AND RESULTS

Mobile devices were detected by a number of Bluetooth receivers continuously performing discovery of active Bluetooth enabled device. The data captured included the unique device MAC address, Bluetooth device name and Bluetooth device class (if available). The distribution of phone manufactures was derived from the data by mapping the MAC addresses of the Bluetooth transmitters to the manufactures found in the IEEE Public OUI listing [6].

Thus far a total of 274,371 data points have been collected at the Roskilde Festival, recording information on 18,374 unique Bluetooth transmitters, and a total of 205,597 data points have been collected at Lancaster University, representing 7,255 unique Bluetooth transmitters.

4.1 ROSKILDE FESTIVAL

Figure 1 below, shows the number of devices that were found at the 2007 and 2008 festivals by manufacturer. In 2007, Nokia held a lender lead over Sony Ericsson, both of which were clearly ahead of Samsung and LG. It should be noted that the majority of Motorola devices only allow the user to make their device discoverable for short periods of time and so these devices are unlikely to be detectable, which could explain the negligible discovery of Motorola devices.

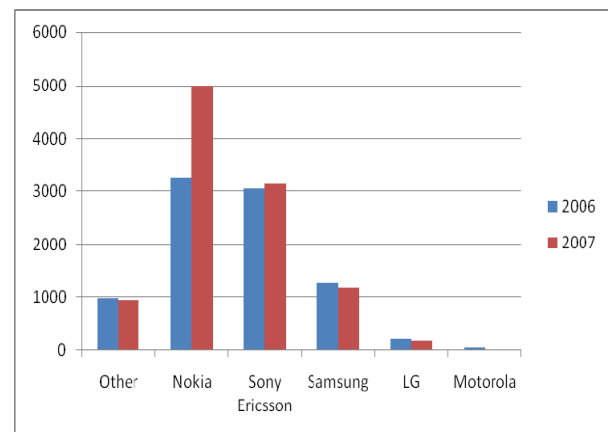


Figure 1. Number of devices by manufacturer

Figure 2 shows the same figures expressed as a percentage. Nokia's share of devices increased from 36.9% to 47.7%. This increase is more significant than the 3-5% increase in market share gained by Nokia during the same period, providing indications that Nokia have been particularly successful in targeting this particular age group as found in these particular settings.

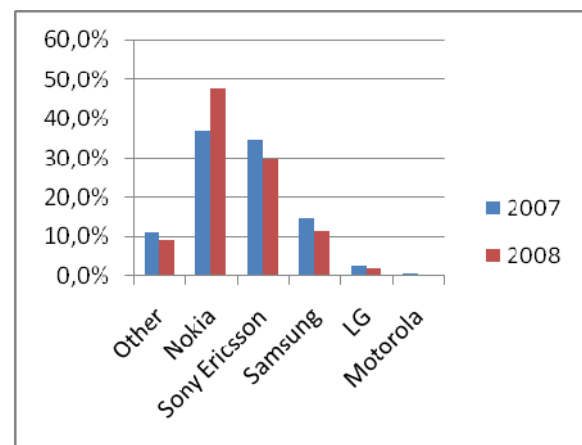


Figure 2. Percentage share by manufacturer

The 4.6% decline by market share for Sony Ericsson is also significant given that this is a group of consumers with a common interest in music, and the importance of Sony Ericsson's

Walkman brand when targeting this demographic. Similarly, Samsung have slipped back, again a slight surprise since the style of their phones is aimed at a youthful demographic group.

So, has the increase in Nokia devices been the result of more fashionable phones (hitting at Samsung's market share), or music devices (hitting Sony Ericsson's share)? In fact, 47% of the Nokia devices were Smart Phones (compared with just 3% of Sony Ericsson devices) which suggests that it is functionality rather than music or style that has driven the increase in share. It is also often suggested that Nokia's market share is inflated by the number of cheap low-end phones but this figure shows that this demographic have more sophisticated needs and greater expectations of their devices. Overall 26.9% of devices were Smart Phones, the majority of which were Nokia devices. This high level of Smart Phone ownership amongst Nokia owners is also important since as user's age they are more likely to look for "business" phones and experience of Nokia Smart Phones at this age is likely to lead to strong brand loyalty later.

Whilst Sony Ericsson have slipped in share from 2007 to 2008, news is not all bad since their 29.9% share is significantly greater than their overall market share of 8.8% would suggest. Again development of a strong brand relationship at this age could lead to stronger growth in the future. However, given that 97% of the Sony Ericsson devices are classified as cell phones, their owners may be forced to look elsewhere if they require a smart phone in the future.

Finally there was another interesting observation from the data from the Roskilde Festival. Since fairly accurate data on the total number of participants was available it was possible to determine that more than 10% of the participants seem to have Bluetooth switched on always and in discoverable mode. However, based on the available data it is not possible to conclude on the reasons for this or the actual usage of Bluetooth (if any).

4.2 LANCASTER

The Lancaster census shows a slightly different picture to the Roskilde Festival census. In Lancaster, over the last two years, Sony Ericsson has shown a consistent lead. The graph below shows that over the period 29.2% of devices have been Sony Ericsson devices, 27.2% Samsung, and 27.2% Nokia (Samsung marginally ahead with three more devices than Nokia). This reinforces the above expected performance of Sony Ericsson in this age group and is consistent with the proportion found at the Roskilde Festival.

The Nokia share is below expectations, however, with 27.2%. The Lancaster community is far more ethnically diverse than the Roskilde Festival audience with a large proportion of Asian students which could help explain the below expected performance of Nokia and significantly improved performance of Samsung (although LG another asian-brand performs below market share as well). The Lancaster University student population has more female than male students and so this could also represent the strength of the Samsung brand amongst young fashion-conscious women.

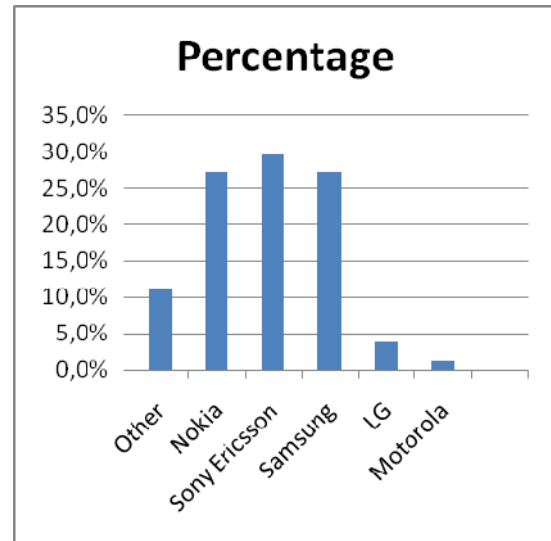


Figure 3. Lancaster Percentage Share by manufacturer

5. CONCLUSIONS

We have, briefly, shown that the collection of census data from discoverable Bluetooth devices can provide insights into trends of use of mobile devices in the wild. We have presented data based on two sources of information, one in the UK, and one in Denmark, designed to target a specific demographic of 18-25 year olds; one catchment targeting users with a specific common interest and the second a wider range of nationalities and backgrounds. The data presented is based on 25,000 phones representing a significant snapshot on device usage amongst this age group. The results vary significantly from the established global market shares, reinforcing the need to study particular groups separately when studying trends in the market. Sony Ericsson significantly outperforms their market share in both Lancaster and Roskilde, a likely reflection of their Walkman brand which is aimed at a younger audience. Samsung, however, performed significantly better in a diverse multi-cultural environment than compared to the music-oriented north European dominated demographic at the Roskilde Festival. Finally, the high level of Smart Phones amongst the Nokia device points to a strong future for Nokia with users selecting Nokia devices when purchasing more sophisticated (and generally more expensive) devices.

6. ACKNOWLEDGMENTS

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